

I Claim:

1. A pipe joint between a cylindrical male coupler received in a female coupler, said male and female couplers having terminal end portions with cooperating
5 cam surfaces that facilitate insertion of said male coupler into said female coupler, said male and female couplers having cooperating projections that cam past one another when said male coupler is inserted into said female coupler and that engage one another to inhibit longitudinal separation of said male and female couplers.
- 10 2. The joint of claim 1 including a gasket on said male coupler between said male coupling terminal end portion and said male coupler projection, and said female coupler having an inner surface sealingly engaged by said gasket.
- 15 3. The joint of claim 2 wherein said male and female couplers have longitudinal axes and said male and female couplers are articulatable to skew said axes up to at least several degrees.
- 20 4. The joint of claim 1 wherein said male coupler has an abutment engageable by said terminal end portion of said female coupler and said female coupler has an abutment engageable by said terminal end portion of said male coupler.
- 25 5. The joint of claim 4 wherein said abutments are concavely curved.
6. The joint of claim 1 wherein said male and female couplers are made from extruded plastic strips having opposite strip ends, said strips being bent into a cylindrical shape and welded together at said opposite ends.

7. The joint of claim 1 wherein said male coupler has a male spline extending in an opposite direction from said male coupler, and said spline is displaced radially outward from said male coupler.

5 8. The joint of claim 1 wherein said female coupler has a female coupler spline extending in an opposite direction from said female coupler, and said female coupler spline is displaced radially inward from said female coupler.

9. The joint of claim 1 wherein said female coupler has an outer surface
10 with an outer surface diameter that is not larger than the outer diameter of a pipe that said female coupler is attached to.

10. The joint of claim 1 wherein said male coupler has an inner surface
15 with an inner surface diameter that is not smaller than the inner diameter of a pipe that said male coupler is attached to.

11. A cylindrical female pipe coupler having a longitudinal axis, said coupler having a spline portion and a female coupling portion extending in opposite directions generally parallel to said axis, said spline portion being attachable to a pipe,
20 said female coupling portion having inner and outer surfaces and a terminal end, a sloping cam surface extending from said terminal end in a direction toward said longitudinal axis and back toward said spline portion, said cam surface terminating at an intersection with a shoulder that extends from said inner surface of said female coupling portion toward said longitudinal axis so that said intersection is spaced
25 toward said longitudinal axis from said inner surface and is spaced toward said spline from said terminal end of said female coupling portion.

12. The coupler of claim 11 wherein said female coupling portion is displaced radially outwardly of said longitudinal axis from said spline portion.

13. The coupler of claim 12 including a transition portion between said spline portion and said female coupling portion, said transition portion extending toward said longitudinal axis from said female coupling portion and having a concave curved inner surface facing in a direction toward said shoulder.

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14. A cylindrical male pipe coupler having a longitudinal axis, said coupler having a spline portion and a male coupling portion extending generally parallel to said longitudinal axis, said male coupling portion having inner and outer surfaces and a terminal end, said outer surface including a circumferential groove spaced axially from said terminal end and having opposite inner and outer groove sidewalls, a sloping cam surface extending from said terminal end in a direction away from said longitudinal axis and back toward said spline portion to a first intersection with said outer groove sidewall, said outer surface including an outwardly extending circumferential projection adjacent said inner groove sidewall, said projection having a projection outer surface that slopes from said inner groove sidewall in a direction away from said longitudinal axis and back toward said spline portion to a second intersection with a projection inner sidewall, and said second intersection being spaced outwardly from said longitudinal axis farther than said first intersection.

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15. The coupler of claim 14 wherein said male coupling portion is displaced inwardly toward said longitudinal axis from said spline portion.

16. The coupler of claim 14 including a transition portion between said spline portion and said male coupling portion, said transition portion having a concave curved surface adjacent said outer surface of said male coupling portion that faces toward said terminal end.

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17. The coupler of claim 14 including an elastomeric gasket having a gasket base portion received in said groove and having a sealing portion that is

inclined in a direction toward said longitudinal axis and back toward said spline portion.

18. The coupler of claim 17 wherein said groove has a groove bottom and
5 said gasket base portion is adhesively bonded to said groove bottom.

19. The coupler of claim 17 including a lubricant on said gasket, and a removable protective wrap covering said gasket and lubricant.

10 20. The coupler of claim 19 wherein said wrap provides protection against ultraviolet radiation.

21. A cylindrical male pipe coupler having an external elastomeric gasket thereon, a lubricant on said gasket, and a removable protective wrap covering said
15 gasket and lubricant.

22. A pipe having a coupler on at least one end thereof, said pipe having an annular socket on at least one end thereof, a coupler having an annular spline received in said socket, and adhesive bonding said spline within said socket.
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23. A method of forming a coupler ring from an extruded plastic strip comprising the step of forming the strip into a ring with the strip ends positioned opposite one another in spaced-apart relationship, heating the ends of the strip to the softening point of the plastic material, pressing the softened ends together to fuse the
25 softened plastic material, and allowing the softened plastic material to cool.

24. The method of claim 23 including the step of deburring and polishing the plastic material at the joint so that the interior surface of the ring is smooth and has a uniform diameter.

25. The method of claim 23 including the step of heating the entire ring and placing the ring on a mandrel to shape the ring to a uniform cylindrical shape, and allowing the ring to cool slowly and relieve the stress therein.